UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
BOYD, JONATHAN A

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 November 2009</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1 and 4-17</u> is/are pending in the application.
      4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1,4 and 10-17</u> is/are rejected.
7)☒ Claim(s) <u>5-9</u> is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
      Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
      Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
      a)☐ All   b)☐ Some * c)☐ None of:
          1.☐ Certified copies of the priority documents have been received.
          2.☐ Certified copies of the priority documents have been received in Application No. _____.
          3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
      * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
      Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
      Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, filed November 20th 2009, with respect to the rejection(s)

of claim(s) 1-4, 10-17 under 35 U.S.C 102(b) have been fully considered and are

persuasive. Therefore, the rejection has been withdrawn. However, upon further

consideration, a new ground(s) of rejection is made by Park (2002/0130830) in view of

Nitta et al (2002/0027551).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

4.   Claims 1 and 4, 10, 11, 14-17 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Park (2002/0130830) in view of Nitta et al (2002/0027551).

        In regards to claims 1, 15 and 17, Park teaches a display device comprising an

adjustable light source (*See; Fig. 1, element 120*); a display panel with display pixels for

modulating light originating from the light source (*See; Fig. 1, element 110 and p[0023]–*

p[0024]); and processing circuitry coupled to the display panel and the light source

(*See; Fig. 1, element 200 and p[0026]-p[0028]*) ,the processing circuitry having an input

for receiving an input signal representing gray levels of pixels of an image to be

displayed on the display panel (*See; Fig. 1, where inputs RGB connect to data counter*

210 and p[0029]) and comprising: means for selecting a dimmed brightness level of the

light source in dependence on the gray levels of the image pixels (*See; Fig. 3, steps x10*

and p[0030]-p[0035] where the number of low and high gray levels are counted for the

purpose of having an action on the luminance), the means for selecting being adapted

to select the dimmed brightness level in dependence on a number of occurrences of a

gray level corresponding to a brightness level of display pixels below a predetermined

brightness level (*See; Fig. 2 where the backlight brightness is adjusted (dimmed)*

depending on a number of grey levels below the predetermined level of 32/64) and

means for adapting the input signal in dependence on the dimmed brightness level

(*See; Fig. 3, steps x20 and p[0036] for data conversion*). Park fails to teach substantially

minimizing an error function including one or more weighted numbers of occurrences

formed by multiplying each of the one or more numbers of occurrences by a weighting

factor.

However Nitta teaches substantially minimizes an error function including one or

more weighted numbers of occurrences formed by multiplying each of the one or more

numbers of occurrences by a weighting factor (*See; Fig. 6C where the grayscale curve*

is set to the desired grayscale. Where to get from a curve as shown in Figures 6A or 6B

that have brightness levels above and below the desired gray level, would require the

curve to be multiplied by a number to have it reach the desired grayscale as shown in

Fig. 6C).

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to combine the teachings of Nitta with Park to reduce errors in reaching

the desired brightness level in the adjustable light source.

In regards to claim 4, Nitta teaches the error function being formed by an addition

of the one or more weighted numbers of occurrences (*See Figures 6A and 6B where*

there are multiple points above and below the desired gray scale that would each have

to be multiplied by a weighted number to reach the figure of 6C and thus be added to

reach the linear curve).

In regards to claim 10, Park teaches the predetermined brightness level being

formed by the maximum contrast ratio of the display panel and the dimmed brightness

level (*See; Fig. 2 and Fig. 3*).

In regards to claim 11, Park inherently teaches the input signal comprising color

components of the image (*See; Fig. 1, RGB input*), a component error function being

determined for each of the color components, the error function being formed by adding

the component error functions (*Inherently taught in the situation of the weighting factor*

equaling zero, thus the weighted numbers would also equal zero and would further

result in the error function equaling zero).

In regards to claim 14, Park inherently teaches wherein the means for selecting a

dimmed brightness level are further adapted to select the dimmed brightness level in

dependence on a content of a part of the image (*When confronted with the problem of*

not distorting the image processing due to external effects, it would have been obvious

to process only the useful portion of the image to save processing time).

In regards to claim 16, Park teaches signal processing circuitry for providing the

input signal (*See; Fig. 1, element 900).*

5.   Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Park (2002/0130830) in view of Nitta et al (2002/0027551) as applied to claim 1

above, and further in view of Usul et al (EP 0513551) (herein "Usul").

In regards to claim 12, Usul teaches the processing circuitry further comprising

means for determining a smoothed dimmed brightness level for an image in

dependence on the dimmed brightness level of the image and a previous smoothed

dimmed brightness level of a previous image, wherein n is a sequence number of

successive images (*See; Abstract where the new brightness level is adjusted in*

accordance with the previous level).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Park and Usul's brightness adjustment using previous levels because using the information of previous images is a known technique used for a plurality of reasons, including motion estimation, response time improvement and error calculation.

In regards to claim 13, Usul inherently teaches the smoothing having a faster response time to an increasing dimmed brightness level of subsequent images than to a decreasing dimmed brightness level of subsequent images (*When confronted with the problem of increasing the response time for implementing a new dimmed brightness level, it would have been obvious to reduce the counterbalancing effect of previous dimmed brightness levels to increase response time*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Park and Usul's brightness adjustment using previous levels because using the information of previous images is a known technique used for a plurality of reasons, including motion estimation, response time improvement and error calculation.

Allowable Subject Matter

6.   Claims 5-9 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 differs from the disclosure of Park and Nitta in that, no error optimization with regards to the upper and/or lower gray levels are performed. When confronted with the problem of displaying the maximum number of gray levels of the input image, Park teaches increasing the number of possible brightness levels as referred to in Fig. 3. Thus it would not have been obvious to one of ordinary skill in the art to calculate the dimmed brightness level according to a function minimizing the number of gray levels that will not be displayed.

Claims 6-9 depend directly or indirectly from claim 5 and thus are allowable for all the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN BOYD whose telephone number is (571)270-7503. The examiner can normally be reached on Mon - Fri 6:00 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on 571-272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./
Examiner, Art Unit 2629

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629